

## DoD Psychological Health/Traumatic Brain Injury (PH/TBI) Research Program

*Each year, the Department of Defense's office of the Congressionally Directed Medical Research Programs (CDMRP) assesses scientific opportunities to advance research in specific areas. The investigators supported by individual programs are making significant progress against targeted diseases, conditions, and injuries. This list is not intended to be a full representation of accomplishments, but rather a sampling of the broad portfolio of research and advances resulting from congressional appropriations.*

| Year | PH/TBI Research Contributions   | Additional Information and Hyperlinks   |
|------|---|---|
| 2007 | Three multidisciplinary research consortia, Strong Star, INTRuST, and Mission Connect, were established to advance research in PTSD and/or TBI. The spectrum of studies range from basic science to clinical research and trials.   |   |
| 2007 | Dr. He Li showed that administration of corticosterone prior to or following intense, repeated stress prevented traumatic memory retrieval in an animal model of PTSD.  |   |
| 2007 | Dr. Jeffrey Pyne developed virtual reality stress inoculation biofeedback training as a predeployment intervention to reduce PTSD development and related mental health problems.   |   |
| 2007 | Dr. Liying Zhang developed an idealized three-dimensional human head model to examine the blast phenomena and determined that the maximum peak pressure transmitted to the scalp, skull, and brain is higher than the blast pressure received by the head.  |   |
| 2007 | Dr. Paul Kizakevich developed an easy-to-use Personal Health Monitor for longitudinal data collection to study signs, symptoms, triggers, and behaviors in PTSD and mTBI patients. The device allows for the collection of comprehensive physical and physiological data while minimizing subject burden.   |   |
| 2007 | Dr. Mikulas Chavko determined that pressure detected in the rat brain following exposure to blast overpressure is contingent on the orientation to the blast direction, suggesting that pressure waves enter the protective tube and body by diffraction, moving in the opposite direction of the blast wave.   |   |
| 2007 | Dr. Michael Vitek measured the safety and toxicity of COG1410 in rats and dogs to form the basis of an Investigational New Drug application to the FDA for the treatment of TBI. COG1410 is a mimetic of the wild-type apoE protein but it is very small and therefore crosses the blood-brain barrier and exerts anti-inflammatory and neuroprotective activities similar to wild-type apoE. |   |
| 2007 | Dr. Charles Levy leveraged combat veterans' comfort and familiarity with communications technology and immersive environments to build a prototype virtual-world environment in which to conduct therapy for returning combat veterans with mTBI/PTSD.  | <ul style="list-style-type: none"> <li>• <a href="#">PH/TBI Video Highlight</a></li> </ul>    |
| 2007 | Dr. Nicholas Webster identified the lead drug, 5E5, and 38 other promising compounds for the treatment of brain injury based on their ability to activate the TrkB receptor.  | <ul style="list-style-type: none"> <li>• <a href="#">PH/TBI Research Highlight</a></li> </ul> |
| 2007 | Dr. Roger Pitman found that propranolol blocks reconsolidation of fear conditioning in a rat animal model. Human studies show that propranolol plus traumatic memory activation reduces symptoms of chronic PTSD.   |   |

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| 2007 | Dr. Donald Stein developed a set of analogs specifically to maintain the neuroprotective properties of progesterone while increasing solubility following TBI.  |   |
| 2007 | Dr. Peter Bergold determined that minocycline and N-acetylcysteine synergistically improve behavioral performance following moderate controlled brain injury in rats.   |   |
| 2007 | Drs. James Tour and Thomas Kent of the Mission Connect Consortium synthesized potent antioxidant nanomaterials that use small carbon nanotubes to carry antioxidants for the treatment of oxidative stress following TBI, representing an entirely new class of treatment for TBI.  | <ul style="list-style-type: none"> <li>• <a href="#">PH/TBI Video Highlight</a></li> <li>• <a href="#">PH/TBI Research Highlight</a></li> </ul> |
| 2007 | Lt Col Jeffrey Cigrang, a Strong Star Consortium investigator, found preliminary evidence through a pilot clinical trial that cognitive behavioral therapy may be successfully provided to service members in a primary care setting. Currently, a substantial number of veterans affected by PTSD do not receive the professional care they need due to the stigma associated with seeking help through a mental health clinic. This approach may help overcome this barrier to care and better meet the needs of service members.   | <ul style="list-style-type: none"> <li>• <a href="#">PH/TBI Research Highlight</a></li> </ul>   |
| 2007 | Dr. Ismene Petrakis demonstrated that prazosin, an alpha-1 adrenergic receptor antagonist, is an effective treatment for PTSD and co-morbid alcohol dependence.   |   |
| 2007 | Dr. Murray Raskind and associated investigators successfully completed a double-blinded randomized controlled trial to evaluate prazosin efficacy and tolerability to treat nightmares and sleep disturbances related to combat trauma PTSD in Active Duty Service members. The study demonstrated that prazosin was well tolerated and highly effective in reducing PTSD symptoms, including sleep-related comorbidities. Prazosin is an inexpensive, clinically available drug, and this study supported immediate translating of the findings to support clinical application. | <ul style="list-style-type: none"> <li>• <a href="#">PH/TBI Video Highlight</a></li> </ul>  |
| 2007 | Dr. Michael McCrea found that the Military Acute Concussion Evaluation (MACE) is a reliable and valid measure for measuring cognitive function following military-related TBI. The study also found that the MACE is a valuable tool to rapidly assist in clinical decision-making following mTBI.  |   |
| 2007 | Dr. Jamshid Ghajar developed a military ready, portable, ruggedized goggle-style device (EYE-TRAC) to assess eye-movement deficits related to mTBI.   |   |
| 2007 | Dr. Stephen Thorp's study of prolonged exposure therapy (PE) for PTSD demonstrated clinically significant improvements when delivered either in-person or by video conference. The telemedicine-based delivery may be advantageous for veterans with PTSD living in remote areas.   |   |
| 2007 | Dr. Mark George, an INTRuST investigator, conducted a pilot safety and feasibility study of transcranial magnetic stimulation to rapidly stabilize patients with PTSD and/or mTBI exhibiting suicidality.   |   |
| 2009 | Dr. Mikulas Chavko used a rat model of blast injury to reveal that pressure detected in the rat brain is contingent on the orientation to the blast direction.  |   |

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| 2009 | Dr. Ksenia Ustinova developed a low-cost virtual reality-based system to be used in physical rehabilitation of subjects experiencing motor coordination defects post-TBI. Data analysis indicated all subjects demonstrated improved motor function after utilization of the training regimen.   |   |
| 2009 | Dr. Jed Hartings and Dr. Raj Naryan developed a smart brain catheter to continuously and accurately measure biochemical, physiological, and electrophysiological characteristics of excess cerebral fluid resulting from TBI.  |   |
| 2009 | Dr. Charles Wilkinson found clinical evidence for increased post-traumatic hypopituitarism (diminished production of hormones from the pituitary gland) in veterans with a history of blast mTBI.  |   |
| 2010 | Dr. David Poulsen demonstrated low-dose methamphetamine is neuroprotective following TBI in a rat model of TBI. Intravenous administration acutely following TBI resulted in improved neuron survival and improved neurobehavioural outcomes compared to control.  |   |
| 2011 | AnthroTronix (Dr. Corinna Lathan) received FDA clearance for the Defense Automated Neurobehavioural Assessment (DANA) mobile application. The DANA is a computerized cognitive test battery that can assist healthcare professionals in assessing various brain health concerns in a clinical setting. The tool is a phone or tablet app which can be deployed on both iOS and Android operating systems.  |   |
| 2012 | The DoD and the VA collaborated to establish two new consortia focused on developing more effective diagnoses and treatment of PTSD and mTBI. The Consortium to Alleviate PTSD (CAP), led by Dr. Alan Peterson, and the Chronic Effects of Neurotrauma Consortium (CENC), led by Dr. David Cifu, are dedicated to improving the health and welfare of our nation's service members, veterans, and their family members.  | <ul style="list-style-type: none"> <li>• <a href="#">PH/TBI News Release</a></li> </ul> |
| 2013 | TBI Endpoints Development (TED) Award established a collaborative, multi-disciplinary research team to advance clinically validated endpoints which can support regulatory approvals of TBI diagnostics and therapeutics. The team is led by Dr. Geoffery Manley at the University of California, San Francisco.   |   |
| 2013 | DoD funding began to support entry of data from completed PH/TBI studies (from previous funding cycles) into the Federal Interagency TBI Research (FITBIR) informatics system. FITBIR is a joint DoD and NIH-developed platform to share data generated from funded TBI studies and to facilitate and enhance collaboration, and it supports the National Research Action Plan (NRAP). Access to these "legacy" data will greatly enhance the immediate utility of FITBIR. |   |